

Chapter NR 422

**CONTROL OF ORGANIC COMPOUND EMISSIONS
FROM SURFACE COATING, PRINTING AND ASPHALT
SURFACING OPERATIONS**

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NR 422.01 Applicability; purpose. (1) **APPLICABILITY.** This chapter applies to all surface coating and printing process air contaminant sources and to their owners and operators. This chapter also applies to the handling and use of cutback asphalts for application to surfaces traversed by motor vehicles, bicycles or pedestrians and to all persons responsible for such handling and use.

(2) **PURPOSE.** This chapter is adopted under ss. 144.31 and 144.38, Stats., to categorize organic compound emissions from surface coating, printing and asphalt surfacing operations into separate organic compound air contaminant source categories and to establish emission limitations or other requirements for these categories of sources in order to protect air quality.

History: Cr. Register, September, 1986, No. 369, eff. 10-1-86; am. Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.02 Definitions. In addition to the definitions in this section, the definitions contained in chs. NR 400, 419, 420 and 421 apply to the terms used in this chapter.

(1) "Air dried coating" means coatings which are dried by the use of air or forced warm air. Forced warm air includes processes whereby the coated object is heated above ambient temperature up to a maximum of 90°C (194°F) to decrease drying time.

(2) "Application area" means the area where a coating is applied by spraying, dipping or flow coating techniques.

(3) "Asphalt" means a dark-brown to black cementitious material (solid, semisolid, or liquid in consistency) in which the predominating constituents are bitumens which occur in nature as such or which are obtained as residue in refining petroleum.

(4) "Baseline transfer efficiency" means the typical transfer efficiency, as defined by the department, for a specific operation in an industry.

(41m) "Saturation coating" means application of a coating which permeates the substrate to which it is applied.

(41p) "Screen printing" means a process in which ink or coating is passed through a taut screen mesh or fabric, to which a refined form of stencil has been applied, onto a substrate. The stencil openings determine the form and dimensions of the imprint made on the substrate.

(41s) "Screen printing unit" means a printing application station and its associated flash-off area, ovens or dryers, conveyors or other equipment operating as part of the screen printing process. Screen reclamation is considered to be part of the screen printing process.

(41v) "Screen reclamation" means the removal of the stencil or of residual ink or coating from the screen mesh or fabric after excess ink or coating has been removed from the screen or fabric.

(42) "Single coat" means a single film of coating applied directly to a metal substrate, omitting the primer application.

(42m) "Special purpose screen printing inks and coatings" means inks and coatings used in screen printing which are conductive inks, are used to print ink transfers, or are designed to resist or withstand any of the following:

(a) More than 2 years of outdoor exposure.

(b) Exposure to chemicals, solvents, acids, detergents, oil products or cosmetics.

(c) Temperatures in excess of 170° F.

(d) Vacuum forming.

(e) Embossing.

(f) Molding.

(42q) "Stripe-kilometer" means one 10-centimeter-wide solid stripe of traffic marking material that is 1.0 kilometer long.

(42s) "Stripe-mile" means one 4-inch-wide solid stripe of traffic marking material that is 1.0 mile long.

(43) "Surface coating" means the application of a coating to a product in a coating line.

(44) "Thin particleboard" means a manufactured board 0.64 centimeters ($\frac{1}{4}$ inch) or less in thickness made of individual wood particles which have been coated with a binder and formed into flat sheets by pressure.

(45) "Three-piece can side-seam spray" means a coating sprayed on the exterior and interior of a welded, cemented or soldered seam to protect the exposed metal.

(46) "Tileboard" means paneling that has a colored waterproof surface coating.

(46m) "Tinted pigmented coating" means a pigmented coating which contains less than 99.5% by weight white prime pigment as a percentage of all prime pigments.

(47) "Topcoat" means a coating applied over a prime coat for purposes of appearance, identification or protection of the substrate.

(47m) "Traffic marking material" means any substance, either solid or liquid at time of application, used to provide land delineation or other traffic guidance or information on paved surfaces. Markings provided by traffic marking material include, but are not limited to, centerlines, edge-lines, lane lines, turn arrows, parking stall markings, crosswalks, curb markings, railroad markings and airport taxi and runway markings.

(48) "Transfer efficiency" means the portion of coating solids which adheres to the surface being coated during the application process, expressed as a percentage of the total volume of coating solids delivered to the applicator.

(49) "Two-piece can exterior end coating" means a coating applied by roller coating or spraying to the exterior end of a can to provide protection to the metal.

(50) "Vinyl coating" means printing on or applying a decorative or protective topcoat, other than vinyl plastisols or organosols, to vinyl or urethane coated fabric or vinyl or urethane sheets.

(51) "White pigmented coating" means a pigmented coating which contains 99.5% or more by weight white prime pigment as a percentage of all prime pigments.

History: Renum. from NR 154.01, Register, September, 1986, No. 369, eff. 10-1-86; cr. (24m), Register, January, 1987, No. 373, eff. 2-1-87; cr. (21m), Register, July, 1988, No. 391, eff. 8-1-88; cr. (12m), (16m) and (33m), am. (34) and (47), Register, August, 1989, No. 404, eff. 9-1-89; renum. (6) to be NR 400.02 (21m), am. (16), (32) (33m) and (50), cr. (28m), (33g) and (41m), (12s) renum. from NR 400.02 (36), Register, February, 1990, No. 410, eff. 3-1-90; am. (7), Register, May, 1992, No. 437, eff. 6-1-92; am. (50), Register, December, 1993, No. 456, eff. 1-1-94; cr. (11m), (21s), (41p), (41s), (41v) and (42m), am. (32), Register, June, 1994, No. 462, eff. 7-1-94; cr. (16e), (42q), (42s) and (47m), Register, July, 1994, No. 463, eff. 8-1-94; am. (7) and (34), cr. (12e), (18m), (24s), (27m), (33d), (34m), (46m) and (51), Register, August, 1994, No. 464, eff. 9-1-94.

NR 422.03 Exemptions. Sections NR 422.04 to 422.155 apply to any facility which contains one or more of the surface coating or printing process lines described in ss. NR 422.05 to 422.155, except as specified in this section. If VOC emissions exceed an exemption level given in this section, the exemption will no longer apply to the source. Exempt facilities are subject to the recordkeeping requirements of s. NR 439.04 (4). Exempt facilities include:

(1) Any surface coating process line which meets the specific applicability requirements of ss. NR 422.04 to 422.155 within a facility when actual emissions of VOCs from all surface coating process lines meeting the same applicability requirements within the facility are never greater than 6.8 kilograms (15 pounds) in any one day with all emission control equipment inoperative.

(2) Surface coating facilities as described under s. NR 422.15 or 422.155 which have maximum theoretical emissions of VOCs from all surface coating process lines meeting the applicability requirements of s. NR 422.15 or 422.155 within the facility of less than or equal to 10 tons per year.

(3) Surface coating facilities as described under ss. NR 422.05 to 422.08, 422.09 to 422.13, 422.15 and 422.155 which are located outside

the counties of Brown, Calumet, Dane, Dodge, Door, Fond du Lac, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha, and Winnebago and which have total emissions of VOCs from the facility, with all emission control equipment inoperative, of less than or equal to 100 tons per year.

(4) Printing facilities as described under s. NR 422.14 which are located in the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and have maximum theoretical emissions of VOCs from the facility of less than or equal to 25 tons per year, or are located outside the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington and Waukesha and have maximum theoretical emissions of VOCs from the facility of less than or equal to 100 tons per year.

(4m) Screen printing facilities as described under s. NR 422.145 which are:

(a) Located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha; or

(b) Located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and which have maximum theoretical emissions of VOCs from all screen printing units at the facility of less than or equal to 25 tons per year; or

(c) Located in the county of Kewanee, Manitowoc or Sheboygan and which have maximum theoretical emissions of VOCs from all screen printing units at the facility of less than or equal to 100 tons per year.

(5) Surface coating process sources used exclusively for chemical or physical analysis or determination of product quality and commercial acceptance where:

(a) The operation of the source is not an integral part of the production process; and

(b) The emissions from the source do not exceed 363 kilograms (800 pounds) in any calendar month; and

(c) The exemption is approved in writing by the department.

(6) Leather surface coating facilities as described under s. NR 422.085 which are:

(a) Located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha; or

(b) Located in the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington, or Waukesha, and which have maximum theoretical emissions of VOCs from the facility of less than 25 tons per year; or

(c) Located in the counties of Door, Kewaunee, Manitowoc, Sheboygan or Walworth, and which have maximum theoretical emissions of VOCs from the facility of less than 100 tons per year.

(8) Any molded wood parts and products coating facility that is any of the following:

(a) Located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha.

(b) Located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and which has maximum theoretical emissions of VOCs from all molded wood parts and products coating at the facility of less than 25 tons per year.

(c) Located in the county of Kewaunee, Manitowoc or Sheboygan and which has maximum theoretical emissions of VOCs from all molded wood parts and products coating at the facility of less than 100 tons per year.

(9) Any wood entry or passage door coating facility that is any of the following:

(a) Located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha.

(b) Located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and which has maximum theoretical emissions of VOCs from all wood entry or passage door coating at the facility of less than 25 tons per year.

(c) Located in the county of Kewaunee, Manitowoc or Sheboygan and which has maximum theoretical emissions of VOCs from all wood entry or passage door coating at the facility of less than 100 tons per year.

History: Renum. from NR 154.13 (4) (a) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (3) and cr. (6), Register, January, 1987, No. 373, eff. 2-1-87; am. (intro.), (2) and (3), Register, August, 1989, No. 404, eff. 9-1-89; am. (intro.), (1) to (4) and (6) (b), Register, February, 1990, No. 410, eff. 3-1-90; am. (intro.) and (2), Register, May, 1992, No. 437, eff. 6-1-92; am. (1) to (4), (6) (a) and (b), Register, December, 1993, No. 456, eff. 1-1-94; cr. (4m), Register, June, 1994, No. 462, eff. 7-1-94; am. (intro.), cr. (8) and (9), Register, August, 1994, No. 464, eff. 9-1-94.

NR 422.04 Methods of compliance. (1) **IN-LINE AVERAGING.** Compliance with the emission limitations of this chapter may be achieved through a daily volume-weighted average of all coatings or inks applied by emission units in a process line subject to the same numerical emission limitation. Any owner or operator achieving compliance by means of this subsection shall comply with the reporting requirements of s. NR 439.03 (7) and the recordkeeping requirements of s. NR 439.04 (5) (g).

(a) No owner or operator of a coating line subject to an emission limitation contained in ss. NR 422.05 to 422.08, 422.09 to 422.12, 422.132 to 422.135, 422.15 or 422.155 and complying with the emission limitation by means of this subsection may cause, allow or permit the daily volume-weighted average VOC content to exceed the emission limitation to which the coatings are subject. For purposes of this paragraph, daily volume-weighted average VOC content shall be calculated by using the following equation:

$$\text{VOC}_A = \left[\sum_{i=1}^n C_i V_i \right] / V_T$$

where:

VOC_A is the volume-weighted average VOC content of 2 or more coatings applied on a coating line during any day in kilograms per liter (pounds per gallon) of coating, excluding water

i is the subscript denoting an individual coating

n is the number of different coatings subject to the same numerical emission limitation applied during any day on a coating line

C_i is the VOC content of each coating (i) as applied during any day on the coating line in kilograms per liter (pounds per gallon) of coating, excluding water

V_i is the volume of each coating (i), excluding water, as applied during any day on the coating line in liters (gallons)

V_T is the total volume of all n coatings subject to the same emission limitation, excluding water, applied during any day on the coating line in liters (gallons)

(b) No owner or operator of a printing line subject to an emission limitation contained in s. NR 422.14 (2) (a) or (b) and complying with the emission limitation by means of this subsection may cause, allow or permit the daily volume-weighted average VOC content to exceed the emission limitation to which the inks are subject.

1. When s. NR 422.14 (2) (a) applies, the daily volume-weighted average VOC content shall be calculated by using the following equation:

$$\text{VOC}_B = \frac{\sum_{i=1}^n C_i L_i V_{VF_i}}{\sum_{i=1}^n L_i V_{VF_i}}$$

where:

VOC_B is the volume-weighted average VOC content of 2 or more inks applied on a printing line during any day in percent VOC by volume of the volatile fraction

i is the subscript denoting an individual ink

n is the number of different inks subject to the same emission limitation applied during any day on a printing line

C_i is the VOC content in percent VOC by volume of the volatile fraction in each ink (i) as applied

L_i is the volume of each ink (i) as applied in liters (gallons)

V_{VF_i} is the volume fraction volatile content in each ink (i) as applied

2. When s. NR 422.14 (2) (b) applies, the daily volume-weighted average VOC content shall be calculated by using the following equation:

$$\text{VOC}_C = \left[\frac{\sum_{i=1}^n C_i V_i}{\sum_{i=1}^n V_i} \right] / V_T$$

where:

VOC_C is the volume-weighted average VOC content of 2 or more inks applied on a printing line during any day in percent VOC by volume, excluding water

i is the subscript denoting an individual ink

n is the number of different inks subject to the same emission limitation applied during any day on a printing line

C_i is the VOC content of each ink (i) applied during any day on the printing line in percent VOC by volume, excluding water

V_i is the volume of each ink (i), excluding water, applied during any day on the printing line in liters (gallons)

V_T is the total volume of all n inks subject to the same emission limitation, excluding water, applied during any day on the printing line in liters (gallons)

(c) An owner or operator of a coating or printing line subject to an emission limitation in this chapter not specified in par. (a) or (b) may comply by means of this subsection only by obtaining prior department approval through an order issued under s. 144.31 (2) (b), Stats., or through a permit. Any approval granted by the department under this paragraph shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

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(2) **GENERAL METHODS.** The surface coating emission limitations shall be achieved by:

- (a) The application of low solvent content coating technology; or
- (b) A vapor recovery system which recovers the solvent for reuse; or
- (c) Incineration or catalytic oxidation, provided that 90% of the nonmethane VOCs (VOC measured as total combustible carbon) which enter the incinerator or oxidation unit are oxidized to non-organic compounds; or
- (d) An equivalent system or approach demonstrated to reliably control emissions to a level at or below the applicable emission limit and approved by the department. Any approval granted by the department under this paragraph shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(3) **HIGH TRANSFER EFFICIENCY COATING APPLICATION.** (a) Surface coating operations covered under ss. NR 422.09 to 422.11 and 422.15 have the added option of achieving compliance with the emission limitation through the use of an alternative control method or system involving a high transfer efficiency coating application system, either when used alone or in conjunction with low solvent content coating technology.

(b) Compliance under the option provided in this subsection must be approved by the department. This requires that:

1. The design, operation, and efficiency of the application system must be certified in writing by the owner or operator and submitted to the department for approval, and

2. The solvent usage per coated part for application system must be less than or equal to the solvent usage per coated part at the applicable emission limitation using baseline transfer efficiency.

(c) Each alternative control method or system approval granted by the department under this subsection shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(4) **CAPTURE SYSTEMS.** The design, operation and efficiency of any capture system used in conjunction with sub. (2) (b), (c) or (d) shall be certified in writing by the owner or operator. The efficiency of the capture system is subject to approval by the department and shall be great enough to insure that the emissions for any day from the controlled line are less than or equal to the amount determined using the following equation:

$$E = \left[\sum_{i=1}^n A_i B_i C_i \right] / D_i$$

where:

E is the total allowable daily emissions of VOCs in kilograms (pounds) from all coatings or inks subject to the same numerical emission limitation and applied on the controlled line

i is the subscript denoting an individual coating or ink

n is the number of different coatings or inks applied

A_i is the allowable emission rate for the coatings or inks pursuant to ss. NR 422.05 to 422.155 in kilograms per liter (pounds per gallon) of coating or ink, excluding water, delivered to the applicator

B_i is the amount of coating material or ink in liters (gallons), delivered to the applicator during the actual production day

C_i is the volume fraction of solids in the coating or ink, delivered to the applicator during the actual production day

D_i is the theoretical volume fraction of solids in the coating or ink necessary to meet the allowable emission rate pursuant to ss. NR 422.05 to 422.15 calculated from:

$$D_i = 1 - [A_i / P_i]$$

where:

P_i is the density of the VOC used in the coating or ink delivered to the applicator during the actual production day in kilograms per liter (pounds per gallon). If the coating or ink does not contain any VOCs, or if the actual VOC density cannot be demonstrated by the owner or operator, a value of 0.88 kilograms per liter (7.36 pounds per gallon) shall be used for P.

History: Renum. from NR 154.13 (4) (b) and am. Register, September, 1986, No. 369, eff. 10-1-86; renum. (1) to (3) to be (2) to (4) and am. (3) (a), (b) (intro.) and 1. and (4), cr. (1) and (3) (c), Register, February, 1990, No. 410, eff. 3-1-90; renum. (1) to be (1) (intro.) and am., cr. (1) (a) to (c), am. (2) (d) and (3) (c), r. and recr. (4), Register, December, 1993, No. 456, eff. 1-1-94.

NR 422.05 Can coating. (1) APPLICABILITY. This section applies, subject to the provisions of s. NR 425.03, to coating applicators and ovens of sheet, can or end coating lines involved in sheet basecoat (exterior and interior) and overvarnish; 2-piece can exterior (basecoat and overvarnish); 2- and 3-piece can interior body spray; 2-piece can exterior end (spray or roll coat); 3-piece can side-seam spray and end sealing compound operations. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a can coating line may cause, allow or permit the emission of any VOCs in excess of:

(a) 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, delivered to each coating applicator from sheet basecoat (exterior and interior) and overvarnish or 2-piece can exterior (basecoat and overvarnish) operations,

(b) 0.51 kilograms per liter of coating (4.2 pounds per gallon), excluding water, delivered to each coating applicator from 2- and 3-piece can
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(e) After December 31, 1982, and until December 30, 1987, 0.44 kilograms per liter of coating (3.6 pounds per gallon), excluding water, from a topcoat coating line.

(f) After December 31, 1987, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a topcoat coating line.

(g) After December 31, 1982, 0.58 kilograms per liter of coating (4.8 pounds per gallon), excluding water, from any final repair coating line.

(5) EMISSION RATE AVERAGING. Each emission limit in this section may be interpreted as a weighted daily average, if specified in an approved compliance plan. The emission limits are referenced to water-borne coatings conventionally applied. Any coating line which achieves an equivalent emission rate per unit area coated shall be deemed in compliance.

History: Renum. from NR 154.13 (4) (g) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), (3) (intro.), (4) (intro.) and (5), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.10 Furniture metal coating. (1) APPLICABILITY. This section applies, subject to the provisions of s. NR 425.03, to the application areas, flashoff areas, and ovens of furniture metal coating lines involved in prime and topcoat or single coating operations. This section does not apply to sources exempted under s. NR 422.03.

(2) EMISSION LIMITATIONS. No owner or operator of a furniture metal coating line may cause, allow, or permit the emission of any VOCs in excess of 0.36 kilograms per liter of coating (3.0 pounds per gallon), excluding water, delivered to each coating applicator from prime and topcoat or single coat operations.

History: Renum. from NR 154.13 (4) (h) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.11 Surface coating of large appliances. (1) APPLICABILITY. This section applies, subject to the provisions of s. NR 425.03, to application areas, flashoff areas, and ovens of large appliance coating lines involved in single, prime, or topcoat coating operations. This section does not apply to:

(a) Sources exempted under s. NR 422.03; or

(b) The use of quick-drying lacquers for repair of scratches and nicks that occur during assembly, provided that the volume of coating does not exceed 0.95 liters (1 quart) in any one 8-hour period for any appliance coating line.

(2) EMISSION LIMITATIONS. No owner or operator of a large appliance coating line may cause, allow or permit the emission of any VOCs in excess of 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, delivered to each coating applicator from single, prime, or topcoat coating operations.

History: Renum. from NR 154.13 (4) (i) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.12 Magnet wire coating. (1) APPLICABILITY. This section applies, subject to the provisions of s. NR 425.03, to the ovens of magnet wire coating operations. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATION.** No owner or operator of a magnet wire coating oven may cause, allow or permit the emission of any VOCs in excess of 0.20 kilograms per liter of coating (1.7 pounds per gallon), excluding water, delivered to each coating applicator from magnet wire coating operations.

History: Renum. from NR 154.13 (4) (j) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.13 Flat wood panel coating. (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the coating lines of flat wood panel facilities involved in the surface coating of printed interior panels made of hardwood plywood and thin particleboard, natural finish hardwood plywood panels, or hardboard paneling with class II finishes. This section does not apply to the manufacture of exterior siding, tileboard, or particleboard used as a furniture component; or to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a flat wood panel coating line may cause, allow, or permit the emission of any VOCs from a coating application system in excess of:

(a) 2.9 kilograms per 100 square meters of coated finished product (6.0 pounds per 1,000 square feet) from printed interior panels, regardless of the number of coats applied;

(b) 5.8 kilograms per 100 square meters of coated finished product (12.0 pounds per 1,000 square feet) from natural finish hardwood plywood panels, regardless of the number of coats applied; and

(c) 4.8 kilograms per 100 square meters of coated finished product (10.0 pounds per 1,000 square feet) from class II finishes on hardboard panels, regardless of the number of coats applied.

History: Renum. from NR 154.13 (4) (k), Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.132 Wood door coating. (1) **APPLICABILITY.** Except as provided in pars. (a) to (c), this section applies to wood entry or passage door coating lines of any wood entry or passage door coating facility. This section does not apply to any of the following:

(a) A facility which is exempt under s. NR 422.03 (9).

(b) Flat wood panel coating lines subject to s. NR 422.13.

(c) Adhesive coatings at the facility.

(2) **EMISSION LIMITATIONS AND APPLICATION REQUIREMENTS.** (a) No owner or operator of an automated wood entry or passage door coating line may cause, allow or permit the emission of any VOCs in excess of:

1. 0.77 kilograms per liter (6.9 pounds per gallon) of coating, excluding water, delivered to an applicator that applies any coating, on or after May 31, 1995, but before May 1, 1997.

2. 0.64 kilograms per liter (5.7 pounds per gallon) of coating, excluding water, delivered to an applicator that applies any coating, on or before May 1, 1997.

(b) An owner or operator of a wood entry or passage door coating facility shall only apply coatings using electrostatic application, flow coating,

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dip coating, low-pressure spray method, paint brush, hand roller or roll coater. All applications equipment shall be in proper operating condition and used in accordance with proper operating procedures.

(3) **RECORDKEEPING REQUIREMENTS.** Any facility subject to this section shall comply with the requirements applicable under s. NR 439.04 (5).

History: Cr. Register, August, 1994, No. 464, eff. 9-1-94.

NR 422.135 Molded wood parts or products. (1) **APPLICABILITY.** Except as provided in pars. (a) and (b), this section applies to molded wood parts or products coating lines of any molded wood parts or products coating facility. This section does not apply to either of the following:

(a) A facility which is exempt under s. NR 422.03 (8).

(b) The use of topcoats which are applied as a stripe not more than 1/2 inch in width to croquet balls and whose use in aggregate never exceeds 500 gallons per year, as applied.

(2) **EMISSION LIMITATIONS.** (a) No owner or operator of a molded wood parts or products coating facility which uses flow coating to apply topcoats may cause, allow or permit the emission of any VOCs in excess of the limitations specified in Table 1.

Table 1
 Emission Limitations For Facilities Using Flow Coating
 To Apply Topcoats

[Kilograms per liter (pounds per gallon) of coating, excluding water,
 delivered to a coating applicator]

Coating	Between May 30, 1995 and May 1, 1997	On and After May 1, 1997
White pigmented prime coating	0.30 (2.5)	0.30 (2.5)
Tinted pigmented prime coating	0.33 (2.75)	0.33 (2.75)
Topcoat	0.64 (5.3)	0.42 (3.5)

(b) No owner or operator of a molded wood parts or products coating facility which applies a topcoat using any application method other than flow coating may cause, allow or permit the emission of any VOCs in excess of the limitations specified in Table 2.

Table 2
 Emission Limitations For Facilities Using Application Methods Other
 Than Flow Coating To Apply Topcoats

[Kilograms per liter (pounds per gallon) of coating, excluding water,
 delivered to a coating applicator]

Coating	Between May 30, 1995 and November 15, 1996	On and After November 15, 1996
Prime coat	0.71 (5.9)	0.30 (2.5)
Topcoat	0.42 (3.5)	0.42 (3.5)

(3) **RECORDKEEPING REQUIREMENTS.** Any facility subject to this section shall comply with the requirements applicable under s. NR 439.04 (5).

History: Cr. Register, August, 1994, No. 464, eff. 9-1-94.

NR 422.14 Graphic arts. (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the printing lines of all packaging rotogravure, publication rotogravure, and flexographic printing facilities. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing line may operate, or cause, allow or permit the operation of the line unless:

(a) The volatile fraction of ink, as it is applied to the substrate, contains 25% by volume or less of VOC and 75% by volume or more of water;

(b) The ink, as it is applied to the substrate, less water, contains 60% by volume or more nonvolatile material; or

(c) The owner or operator installs and operates:

1. A vapor recovery system which reduces the VOC emissions from the capture system by at least 90% by weight;

2. An incineration or catalytic oxidation system, provided that 90% by weight of the VOCs, VOC measured as total combustible carbon,

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which enter the incinerator or oxidation unit are oxidized to nonorganic compounds; or

3. An alternative VOC emission reduction system demonstrated to have at least a 90% reduction efficiency, as measured across the control system, and approved by the department. Any approval granted by the department under this subdivision shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(3) CONTROL SYSTEM. The overall emission reduction efficiency of any capture system and control device used in conjunction with sub. (2) (c) shall be at least:

- (a) 75% where a publication rotogravure process is employed;
- (b) 65% where a packaging rotogravure process is employed; or
- (c) 60% where a flexographic printing process is employed.

History: Renum. from NR 154.13 (2) (1) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), Register, February, 1990, No. 410, eff. 3-1-90; am. (2) (a), (c) 2. and 3., (3) (intro.), (b) and (c), Register, December, 1993, No. 456, eff. 1-1-94.

NR 422.145 Screen printing (1) APPLICABILITY. This section applies to all screen printing units at screen printing facilities which are not exempt facilities under s. NR 422.03 (4m).

(2) EMISSION LIMITATIONS. (a) *General.* No owner or operator of a screen printing unit may cause, allow or permit the emission of any VOCs in excess of 0.40 kilograms per liter (3.3 pounds per gallon) of ink or coating, excluding water, delivered to an applicator, except as provided in pars. (b) and (c).

(b) *Special purpose inks and coatings.* No owner or operator of a screen printing unit using a special purpose ink or coating may cause, allow or permit the emission of any VOCs in excess of 0.80 kilograms per liter (6.7 pounds per gallon) of special purpose ink or coating, excluding water, delivered to an applicator.

(c) *Roll coating.* No owner or operator of a screen printing unit may cause, allow or permit the emission of any VOCs in excess of 0.80 kilograms per liter (6.7 pounds per gallon), excluding water, delivered to a roll coating applicator associated with screen printing.

(d) *Screen reclamation.* No owner or operator of a screen printing unit may cause, allow or permit the emission of any VOCs in excess of 0.24 kilograms per square meter (0.050 pounds per square foot) of screen reclaimed, calculated on a daily average basis for each day of operation using the following equation:

$$C = A/B$$

where:

C is the daily average VOC emission rate, in kilograms per square meter (pounds per square foot), from all screen reclamation at a screen printing facility

A is the amount of VOCs used in all screen reclamation at a screen printing facility during a day, in kilograms (pounds), except that any VOCs directed into containers that prevent evaporation may be subtracted

B is the surface area of all screens reclaimed during a day, in square meters (square feet)

(3) **COMPLIANCE DEADLINE.** The owner or operator of a screen printing unit subject to this section on which construction or modification commenced before July 1, 1994 shall achieve final compliance with the emission limitations of sub. (2) not later than May 31, 1995. Any source which is subject to this section and on which construction or modification commenced on or after July 1, 1994 shall meet the emission limitations of sub. (2) upon startup.

(4) **RECORDKEEPING.** The owner or operator of a screen printing unit subject to this section shall collect and record the information required in s. NR 439.04 (5) (a). In addition, the owner or operator shall collect and record all of the following information for screen reclamation at the facility for each day of operation:

(a) The daily average VOC emission rate from screen reclamation in kilograms per square meter (pounds per square foot) of screen reclaimed as calculated using the equation in sub. (2) (d).

(b) The amount of VOCs emitted during the day from screen reclamation in kilograms (pounds).

(c) The total surface area of screens reclaimed during the day in square meters (square feet).

History: Cr. Register, June, 1994, No. 462, eff. 7-1-94.

NR 422.15 Miscellaneous metal parts and products. (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to all coating line application areas, conveyors, flashoff areas, drying areas, forced air driers, and ovens of any industry categorized under the 2-digit major groups of 33 to 39 as described in the Standard Industrial Classification Manual, 1987, incorporated by reference in ch. NR 484, which are involved in the surface coating of miscellaneous metal parts and products with the following exceptions:

(a) Coating of airplane exteriors;

(b) Coating of marine vessels;

(c) Automobile refinishing;

(d) Customized topcoating of automobiles and trucks if production is less than 35 vehicles per day;

(e) Adhesives and materials used to prepare a surface for adhesives at facilities located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha;

(g) Sealants or fillers whose purpose is to seal or fill seams, joints, holes and minor imperfections of surfaces, and which are applied at facilities located outside the counties of Door, Kenosha, Kewaunee, Manitowoc,

Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha;

(h) Coating lines covered under ss. NR 422.05 to 422.12;

(i) Sources exempted under s. NR 422.03;

(j) Silk screening of metal parts and products at facilities located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha; or

(k) Coating operations subject to s. NR 422.155.

(2) EMISSION LIMITATIONS — CURED COATINGS. No owner or operator of a miscellaneous metal parts or products coating line using a baked or specially cured coating technology may cause, allow, or permit the emission of any VOCs in excess of:

(a) 0.52 kilograms per liter (4.3 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coatings;

(b) 0.42 kilograms per liter (3.5 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies extreme performance coatings; and

(c) 0.36 kilograms per liter (3.0 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.

(3) EMISSION LIMITATIONS — AIR DRIED COATINGS. No owner or operator of a miscellaneous metal parts or products coating line using an air dried coating technology may cause, allow, or permit the emission of any VOCs in excess of:

(a) After December 31, 1982, 0.58 kilograms per liter (4.8 pounds per gallon) of any coating, excluding water, delivered to a coating applicator;

(b) After December 31, 1985, 0.52 kilograms per liter (4.3 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coatings;

(c) After December 31, 1985, 0.42 kilograms per liter (3.5 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.

(4) EMISSION LIMITATIONS — PRETREATMENT COATS. This subsection applies to miscellaneous metal parts and products coating lines which are located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha. No owner or operator of a miscellaneous metal parts or products coating line may cause, allow, or permit the emission of any VOCs in excess of 0.78 kilograms per liter (6.50 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies pretreatment coats. Coatings subject to this subsection may not participate in an internal offset under s. NR 425.05 or generate emission reduction credits in an emission reduction option.

(5) EMISSION LIMITATIONS AND REQUIREMENTS — HIGH PERFORMANCE ARCHITECTURAL COATINGS. This subsection applies to miscellaneous metal parts and products coating lines which were involved in the appli-

cation of high performance architectural coatings, prior to July 1, 1983, and are located outside the counties of Brown, Calumet, Dane, Dodge, Door, Fond du Lac, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha and Winnebago.

(a) No owner or operator of a miscellaneous metal parts or products coating line which applies a high performance architectural coating may cause, allow or permit the emission of any VOCs from the coating in excess of:

1. 0.65 kilograms per liter (5.4 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies prime coatings;

2. 0.70 kilograms per liter (5.8 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.

(b) The owner or operator of a miscellaneous metal parts and products coating line may demonstrate compliance with the emission limits of this subsection by demonstrating, on a daily basis, that the combined emission rate from all high performance architectural coatings is less than or equal to the allowable emission rate as determined by the equation in s. NR 425.05 (2) (b) 2.

(6) CHANGE IN TECHNOLOGY. Miscellaneous metal parts or products coating lines which, prior to January 1, 1980, used a baked or specially cured coating technology shall meet the emission limitations of sub. (2) notwithstanding the coating technology presently in use.

(7) MULTIPLE LIMITATIONS. If more than one emission limitation in sub. (2) applies to a specific coating, then the least stringent emission limitation shall be applied.

(8) SOLVENT WASHINGS. All VOC emissions from solvent washings shall be considered in the emission limitations in subs. (2) and (3), unless the used wash solvent is directed into containers that prevent evaporation into the atmosphere.

History: Renum. from NR 154.13 (4) (m) and am. Register, September, 1986, No. 369, eff. 10-1-86; renum. (4) to (6) to be (5) to (7), cr. (4), Register, July, 1988, No. 391, eff. 8-1-88; am. (1) (h) and (i), cr. (1) (j), Register, April, 1989, No. 400 eff. 5-1-89; am. (1) (i) and (j), cr. (1) (k), Register, August, 1989, No. 404, eff. 9-1-89; am. (1) (b), (2) (intro.) and (3) (intro.), r. (1) (f), renum. (4) to (7) to be (5) to (8) and am. (5) (b), cr. (4), Register, February, 1990, No. 410, eff. 3-1-90; am. (1) (intro.), (e), (g) and (j), (4), (5) (intro.) and (b), Register, December, 1993, No. 456, eff. 1-1-94.

NR 422.155 Fire truck and emergency response vehicle manufacturing.

(1) APPLICABILITY. This section applies to coating operations of fire truck and emergency response vehicle manufacturing where meeting applicable emission limits in s. NR 422.15 is not technologically or economically feasible and where total facility production of fire trucks and emergency response vehicles is less than 35 vehicles per day.

(2) EMISSION LIMITATIONS. No owner or operator of a fire truck or emergency response vehicle coating operation may cause, allow or permit the emission of any VOCs in excess of:

(a) 0.80 kilograms per liter (6.68 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies pretreatment coats.

(b) 0.53 kilograms per liter (4.44 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies prime coats.

(c) 0.72 kilograms per liter (6.00 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies topcoats.

(d) 0.42 kilograms per liter (3.50 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coats.

(3) **SOLVENT WASHINGS.** All VOC emissions from solvent washings shall be considered in the emission limitations in sub. (2), unless the used wash solvent is directed into containers that prevent evaporation into the atmosphere.

(4) **INTERNAL OFFSETS.** Coating operations subject to this section may not be involved in an internal offset under s. NR 425.05.

History: Cr. Register, August, 1989, No. 404, eff. 9-1-89; am. (2) (a) to (d) and (4), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.16 Use of asphalt surfacing materials. (1) **APPLICABILITY.** This section applies to the mixing, storage, use and application of cutback asphalts in Wisconsin. This section does not apply to cutback asphalts intended for uses other than application to surfaces traversed by motor vehicles, bicycles or pedestrians.

(2) **RESTRICTED MATERIALS.** The following restrictions apply to the mixing, open storage, use or application of cutback asphalts during the ozone season:

(a) The use of rapid curing cutback asphalts containing gasoline or naphtha as the diluent is prohibited.

(b) The use of cutback asphalts not prohibited under par. (a) is prohibited except for:

1. Application of a single coat of liquid asphalt to an aggregate base to control dust; and

2. Use as a penetrating prime coat during the first and last months of the ozone season.

History: Renum. from NR 154.13 (5) (a) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (a) and (b), r. (2) (c), Register, February, 1990, No. 410, eff. 3-1-90.

NR 422.17 Application of traffic marking materials. (1) **APPLICABILITY.** This section applies after April 30, 1996, to the application of traffic marking material on any paved surface during the ozone season in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha counties.

(2) **RESTRICTED MATERIALS.** During the ozone season, no person may cause, allow or permit the application of traffic marking material which exceeds the following limits:

(a) Except as provided in par. (b), for traffic marking material that is measurable as a liquid at the time of application, a VOC content of 91 grams per liter of coating or 0.76 pounds per gallon of coating, excluding water.

(b) For field-reacted traffic marking material, or for traffic marking material that is not measurable as a liquid at the time of application, a

VOC emission rate of 3.6 kilograms per stripe-kilometer or 12.2 pounds per stripe-mile.

(3) **RECORDKEEPING.** (a) In addition to the applicable reporting and recordkeeping requirements of ss. NR 439.03 and 439.04, any person who applies traffic marking material and is subject to this section shall retain records sufficient to document the following:

1. Types and amounts of traffic marking materials purchased annually.

2. The VOC content or emission rate of each type of traffic marking material applied, either in grams per liter or pounds per gallon or kilograms per stripe-kilometer or pounds per stripe-mile.

3. Monthly quantities of each type of traffic marking material applied.

4. The counties in which each marking material was applied.

(b) The documentation required in par. (a) shall be kept for a period of 3 years after the traffic marking material is applied.

History: Cr. Register, July, 1994, No. 463, eff. 8-1-94.